Space Weather Forecast

Issued on Friday, 29 September 2023 at 01:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Ongoing chance of isolated Moderate-flares (R1-R2 Radio blackouts). Chance of G1-G2 (Minor to Moderate) geomagnetic storms on Day 3 (01 Oct).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been at Moderate levels, with a single low-level Moderate flare observed from a new sunspot region in the far southeast of the disc.
There are currently eight sunspot regions on the visible disc, with five of these located in the western hemisphere. Most regions are small, weak and magnetically simple, and either stable or gradually decaying. However, AR3450 has the potential to be moderately magnetically complex, but is currently too close to the southeast limb for clear analysis.

No potential Earth-directed Coronal Mass Ejections (CMEs) have been observed.

Solar Wind / Geomagnetic Activity: Solar winds started at slightly elevated levels, peaking at 479 km/s at 28/0135 UTC. After this there was a general, and erratic, decline to background levels until the evening, when a slight increased occurred with wind speeds returning to slightly elevated levels again. This later increase may have been the result of a weak passing CME, possibly the CME which left the Sun on the 25th.The strength of the solar winds magnetic field was predominantly weak, but did briefly reach moderate values during the evening. The north-south component also varied weakly, occasionally in the southward direction. The resultant geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no Solar Radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is expected to remain at Low to Moderate levels, with further isolated Moderate-class flares possible, mainly from the active regions in the eastern disc.

Solar Wind / Geomagnetic Activity: A possible glance from a weak CME arrival cannot be ruled out later today or early tomorrow, however this is deemed very low confidence. Otherwise no CMEs feature in the current forecast period.

Today and tomorrow the solar wind is expected to be at background to slightly elevated levels, initially under the residual influence of a probable weak CME arrival, and thereafter with possible weak coronal hole influence. A more significant, recurrent coronal hole is anticipated to arrive at Earth during Day 3 (1st Oct), and then persist through day 4 (2nd Oct) with slightly elevated to perhaps elevated speeds.

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Met Office Space Weather Forecast

Geomagnetic activity is expected to be largely Quiet to Unsettled today and tomorrow. From Day 3 (1st Oct) activity is expected to increase to Unsettled to Active levels, with a chance of G1-G2/Minor-Moderate Storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background levels, but with a very slight chance of minor Solar Radiation storms.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	40	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	20	20	20	20
Very Active	R3 to R5 X	No	1	1	1	1

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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